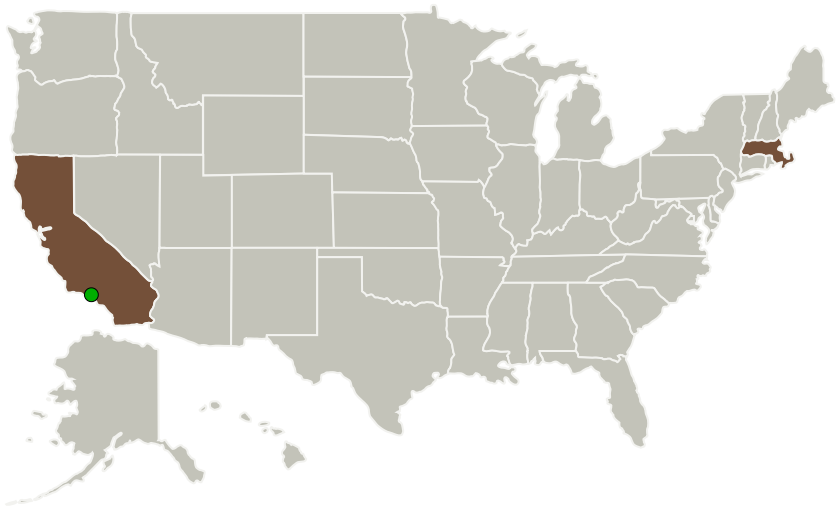
Static Water Vapor Feed Electrolyzer, Phase II

Completed Technology Project (2010 - 2012)

Project Introduction

Development of a static vapor feed electrolyzer utilizing an advanced bipolar plate that produces sub-saturated H2 and O2 is proposed. This novel bipolar design can greatly simplify electrolyzer systems, as it eliminates the need for water/gas phase separation, which is particularly challenging in a zero gravity environment. Maintaining water in the vapor phase greatly reduces membrane swelling which should increase durability. Finally, by keeping water in the vapor phase the MEA is not exposed to ion and other contaminants that are carried by a liquid water stream, further increasing durability and simplifying the system by reducing the need for ultra-pure water. The primary goal of this Phase I program is to demonstrate a high-pressure (1000 psi) static vapor feed electrolyzer and demonstrate that the system can operate without purge of the water feed stream for up to 100 hours.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Giner, Inc.	Lead Organization	Industry	Newton, Massachusetts
Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

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Primary U.S. Work Locations	
California	Massachusetts

Project Transitions

February 2010: Project Start

September 2012: Closed out

Closeout Summary: Launch in FY17 to ISS to provide proof of concept.

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/137323)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Giner, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

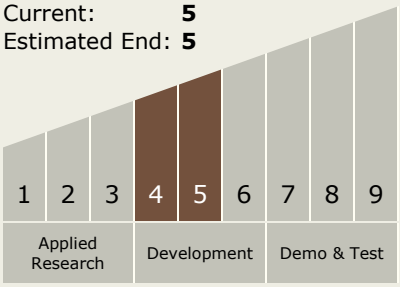
Carlos Torrez

Principal Investigator:

Cortney K Mittelsteadt

Technology Maturity (TRL)

Start: **4**
Current: **5**
Estimated End: **5**



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Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
  - TX03.2 Energy Storage
    - TX03.2.2 Electrochemical: Fuel Cells

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System